Amendments to the Drawings:

The attached sheer of drawings includes changes to Fig. 7. This sheet, which includes Figs. 6-8, replaces the original sheet including Figs. 6-8. In Fig. 7, previously unnumbered element 36 has been so numbered.

Attachment: Replacement Sheet
Annotated Sheet Showing Changes

Remarks/Arguments

Claims 1-28 are pending in the Application.

Claims 1-28 are rejected.

Claims 1, 4, 5, 7-9, 11, 15-19, 21, 23-25 and 27 are amended herein.

I. OBJECTION TO THE DRAWINGS

The Examiner has objected to the drawings because: "Fig. 7 has unidentified lumps on the surface (30a) and are somewhat unclear due to the poor or rough quality of the drawings." Office Action, at 3.

Applicant has herein amended Fig. 7 to properly number droplets 36 on the surface 30a. See attached replacement drawing sheet.

II. REJECTIONS UNDER 35 U.S.C. § 112, ¶2

The Examiner has rejected Claims 1-28 under 35 U.S.C. § 112, ¶2, as "being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention." Office Action, at 2-3.

Regarding Claims 1, 11 and 21, Applicant has amended these Claims to clarify that the volume of the plurality of spaced-apart droplets disposed onto the substrate represents the total volume of liquid. Additionally, these Claims have been amended to clarify that a particular unit volume is specific to a particular subset of spaced-apart droplets. Support for such amending can be found in the Application on page 9, *ll.* 6-17. No new matter is introduced as a result of such amending.

Regarding Claims 4, 9, 15, and 23, Applicant has amended these Claims to clarify that the spreading/compressing is an additional step in the method. Applicant respectfully points out

it is clear that the gas is present prior to such spreading/compressing, and that, based on the Claim language, one of ordinary skill in the art would understand that the spreading/compressing causes movement of said gas, hence the desire to minimize any trapping of said gas within the liquid as a result of such spreading/compressing. Claims 9 and 15 have been additionally amended to eliminate reference to "said predetermined region," which the Examiner points out lacks antecedent basis. Claim 23 has been amended to properly provide antecedent basis to this region. No new matter is introduced as a result of such amending.

Regarding Claims 5, 16 and 24, Applicant has amended these Claims to remove the word "concurrently." Applicant believes it is clear that the first and second directions refer to the compressing. No new matter is introduced as a result of such amending.

Regarding Claim 7, Applicant has amended this Claim to place it in proper Markush format.

Regarding the use of the term "smooth" in Claim 7, Applicant has amended Claim 7 to replace this term with the term "unpatterned," which is consistent with what Applicant originally intended to claim. Regarding the use of the term "complementary" in Claims 10, 18 and 26, Applicants respectfully points out that a person of ordinary skill in the art would recognize that a contiguous layer, patterned by a patterned body, would comprise a pattern that is complementary to that of the patterned body.

Regarding the lack of antecedent basis for "said first dimension" in Claims 8, 17 and 25, Applicant has amended these Claims to provide this antecedent basis.

Regarding Claim 18, Applicant respectfully points out that the term "region" clearly refers to that portion of the substrate in superimposition with the patterned region. This is not entirely synonymous with the "area" described in Claim 11. Applicant has replaced the phase "layer to for..." with "layer to form...," which is consistent with what Applicant originally intended to claim.

Regarding the use of an electromagnetic field in Claims 19-20 and 27-28, Applicant has amended Claims 19 and 27 to require that the electromagnetic field move the plurality of

droplets. Support for such amending can be found in the Application on page 12, ¶37. Claims 20 and 28 clearly describe the interaction between the droplets and the electromagnetic field, requiring that the electromagnetic field cause the droplets to conform to the patterned region.

Regarding Claim 21, Applicant has amended this Claim so as to clarify that the spreading results in contacting the droplets, which is consistent with what Applicant originally intended to claim.

As a result of the forgoing, Applicant respectfully requests that the Examiner withdraw the rejection of Claims 1-28 under 35 U.S.C. § 112, ¶2.

III. REJECTIONS UNDER 35 U.S.C. § 103(a)

The Examiner is reminded that:

> To establish a *prima facie* case of obviousness under 35 U.S.C. § 103(a), three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. *See* M.P.E.P. 706.02(j); *see also In re Vaeck,* 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991).

A) The Examiner has rejected Claims 1-2, 4-6 and 11-13 under 35 U.S.C. § 103(a) as being unpatentable over Donges, United States Patent No. 6,234,379 ("*Donges*"). Office Action, at 5.

The Examiner states:

> Donges teaches depositing individual droplets in a pattern, where they may be singly deposited at a location and the pattern configures to minimize or eliminate voids and air pockets between the substrate and the flip chip, which is pressed down on it consequently spreading the deposited droplets. Note as illustrated and discussed, this would produce a contiguous layer. Donges doesn't discuss minimizing the travel distance or volume, but context suggests uniform size droplets, and minimizing both void excess deposit so it won't squeeze out, would have suggested to one of ordinary skill the use of a pattern that has relatively uniformly spaced droplets in order to achieve both effects, which would in turn have the effect of minimizing travel distances as claimed, such that to do so would have been obvious. Office Action, at 5.

Applicant respectfully points out that *Donges* is directed to a method for attaching a semiconductor die or flip chip to a substrate. This involves using a dispensing apparatus to dispense no-flow flux and underfill material as droplets in a predetermined way on the substrate, the substrate comprising solder pads. A flip chip with solder balls, the solder balls being located underneath, is then attached to the substrate with alignment of the solder balls and the solder pads. See *Donges*, Abstract. Because of the dissimilarity of the technologies involved (imprint lithography vs. flip chip soldering), it is difficult to understand how one of ordinary skill in the art would arrive at the same conclusions the Examiner has. Additionally, there is no suggestion is *Donges* that the droplets of flux/underfill be spaced-apart, as required by all of the rejected Claims. In fact, *Donges* seems to teach away from such a requirement by stating "[a]dvantageously, additional layers may be applied so that the underfill material 34 can assume a desired height profile in the Z-direction as illustrated in FIGS. 2B and 2C." See *Donges*, col. 4, *ll.* 42-45. Accordingly, Claims 1-2, 4-6 and 11-13 are not obvious over *Donges*.

B) The Examiner has rejected Claims 1-18 and 21-26 under 35 U.S.C. § 103(a) as being unpatentable over Nebashi et al., United States Patent No. 6,646,662 ("*Nebashi*"). Office Action, at 5.

The Examiner states:

> Nebashi et al teach using a template (a patterned body) that delivers coating material in a pattern, where the delivery as illustrated in fig. 10 may be by spaced apart drops, with pressure from the pressure chamber of the template, and movement between substrate and template used to form a pattern as illustrated in fig. 1, which has contiguous deposites and has a correspondence of the patterned template. Nebashi et al doesn't discuss minimizing the travel distance or volume, however the teachings on uniform patterning are suggestive of equal volume deposits and with the illustrated even spacing of droplets, may be considered suggestive of claimed minimizing, such that given these teachings it would have been obvious to one of ordinary skill to arrange the droplet deposition pattern to most efficiently achieve the desired pattern which would have effectively included the claimed minimizing. Note as Nebashi et al may adjust the volume of liquid or drops applied to surface for patterning purposes as discussed in col. 5, this suggests differential droplet sizes, and the difference can always be described by some function of an arbitrary unit volume, such that one will be greater than the other. Office Action, at 5-6.

Applicant respectfully points out that *Nebashi* teaches an apparatus comprising a template having "through holes," and methods of making and using said template. Liquid precursor is pushed through the template and onto the surface. In "embodiments one" the template is essentially in contact with the substrate, where in "embodiment two," liquid is dispelled through the template and can then fill the patterned regions of the template. As such, spaced-apart droplets are not truly disposed onto the substrate, as required by all of the rejected claims. Additionally, *Nebashi* teaches away from minimizing the trapping of gases via the size and spacing of the droplets by teaching instead that air or gas is displaced through the template itself, as the template is preferably porous. *See Nebashi*, col. 5, *ll.* 51-60; and col. 7, *ll.* 60-67. Accordingly, Claims 1-18 and 21-26 are not obvious over *Nebashi*.

C) The Examiner has rejected Claims 19-20 and 27-28 under 35 U.S.C. § 103(a) as being unpatentable over *Nebashi* or *Donges*, as applied to Claims 1-18 and 21-26, as appropriate above, and further in view of Everaerts et al., United States Patent No. 5,817,376 ("*Everaerts*"). Office Action, at 6.

The Examiner states:

> Nebashi et al or Donges do not teach use of electromagnetic field in the spreading step of applying the droplets, however, Everaerts et al teach that is advantageous to employ electrostatic assistance to alleviate air entrapment between "coating beads" and the substrate in continuous liquid coating processes, where the electrostatics can be used to move the coating bead, i.e., droplet, with coaters such as gravure, which would have recess patterns are also mentioned. Given primary reference teachings on minimizing void or uniform delivery/patterning of liquid drops, it would have been obvious to one of ordinary skill in the art to employ electrostatics in positioning droplets for advantages as suggested by Everaerts et al, as the alleviation of air entrapment is consistent with desires of either Nebashi et al or Donges and analogous as both employ liquid coating techniques that could be used in a continuous manufacturing environment. Office Action, at 6.

Applicant respectfully points out that *Everaerts* is directed to environmentally-friendly coating technology, with no mention of lithography/imprinting (e.g., *Nebashi*, the present Application) or soldering of flip chips (*Donges*). Notwithstanding the fact that neither *Donges* nor *Nebashi* teach or suggest spaced apart droplets or their size/spacing distance (see above), as a result of the dissimilar technologies involved, the combination of these references is in no way obvious. Accordingly, Claims 19-20 and 27-28 are not obvious over *Nebashi* or *Donges* and further in view of *Everaerts*.

D) The Examiner has rejected Claims 1-2, 4-13 and 15-18 under 35 U.S.C. § 103(a) as being unpatentable over claims 10-14 of Rubin, United States Patent No. 6,929,762 ("*Rubin*"). Office Action, at 7.

Applicant respectfully points out that Claims 10-14 of *Rubin* do not teach modulating the size or spacing of said droplets, as required by all of the rejected Claims. Accordingly, Claims 1-2, 4-13 and 15-18 are not obvious over claims 10-14 of *Rubin*.

As a result of the forgoing, Applicant respectfully requests that the Examiner withdraw the rejection of Claims 1-2, 4-6 and 11-13 under 35 U.S.C. § 103(a) as being unpatentable over *Donges*, the rejection of Claims 1-18 and 21-26 under 35 U.S.C. § 103(a) as being unpatentable over *Nebashi*, the rejection of Claims 19-20 and 27-28 under 35 U.S.C. § 103(a) as being unpatentable over *Nebashi* or *Donges* and further in view of *Everaerts*, and the rejection of Claims 1-2, 4-13 and 15-18 under 35 U.S.C. § 103(a) as being unpatentable over claims 10-14 of *Rubin*.

IV. DOUBLE PATENTING REJECTIONS

A) The Examiner has rejected Claims 1-2, 4-13 and 15-18 under the judicially-created doctrine of obviousness-type double patenting as being unpatentable over Claims 10-14 of *Rubin*. Office Action, at 6.

Applicant respectfully points out that Claims 10-14 of *Rubin* do not teach modulating the size or spacing of said droplets, as required by of the rejected Claims. Accordingly, Claims 1-2, 4-13 and 15-18 are patentable over claims 10-14 of *Rubin*.

B) The Examiner has provisionally rejected Claims 1-2, 4-13 and 15-18 under the judicially-created doctrine of obviousness-type double patenting as being unpatentable over Claims 150-

156, 165-171, 174-175 and 178-179 of co-pending Application No. 09/908,455. Office Action, at 7.

Applicant respectfully traverses this rejection. Application No. 09/908,455 neither teaches nor suggests modulating the size or spacing between the spaced-apart droplets. Accordingly, Claims 1-2, 4-13 and 15-18 are patentable over Claims 150-156, 165-171, 174-175 and 178-179 of co-pending Application No. 09/908,455.

C) The Examiner has provisionally rejected Claims 1-2, 4-13 and 15-18 under the judicially-created doctrine of obviousness-type double patenting as being unpatentable over Claims 1, 3, 6, 8-10 and 15-28 of co-pending Application No. 10/143,092. Office Action, at 7.

Applicant respectfully points out that Application 10/143,092, directed to a "Safety Needle Assembly" and having issued on April 13, 2004 as US 6,719,737, has no relation whatsoever to the present Application, Inventors, or Assignee. Presumably, the Examiner intended to cited a different Application.

D) The Examiner has provisionally rejected Claims 3, 14 and 19-28 under the judicially-created doctrine of obviousness-type double patenting as being unpatentable over Claims as applied above of co-pending Application No. 10/143,092 or 09/908,455, in view of *Nebashi* in view of *Everaerts*, as applied above, noting the difference in these use Claims is the lack of different size drops and use of electromagnetics for spreading. Office Action, at 7.

Applicant respectfully traverses this rejection. Regarding Application No. 10/143,092 , see above. Application No. 09/908,455 neither teaches nor suggests modulating the size or spacing between the spaced-apart droplets, and no combination of this reference with *Nebashi* and/or *Everaerts* would lead one of ordinary skill in the art to the presently claimed invention. Accordingly, Claims 3, 14 and 19-28 are patentable over co-pending Application No. 09/908,455 in view of *Nebashi* in view of *Everaerts*.

E) The Examiner has provisionally rejected Claims 3, 14 and 19-28 under the judicially-created doctrine of obviousness-type double patenting as being unpatentable over Claims 10-14 of *Rubin* in view of *Nebashi* in view of *Everaerts*, as applied above, noting the difference in these use Claims is the lack of different size drops and use of electromagnetics for spreading. Office Action, at 8.

Applicant respectfully points out that, as mentioned above, Claims 10-14 of *Rubin* do not teach modulating the size or spacing of said droplets, as required by of the rejected Claims, and no combination of this reference with *Nebashi* and/or *Everaerts* would lead one of ordinary skill in the art to the presently claimed invention. Accordingly, Claims 3, 14 and 19-28 are patentable over claims 10-14 of *Rubin* in view of *Nebashi* and in view of *Everaerts*.

As a result of the foregoing, Applicant respectfully requests that the above-mentioned double-patenting rejections be withdrawn.

V. CONCLUSION

As a result of the foregoing, it is asserted by Applicant that the Claims in the Application are now in a condition for allowance, and respectfully request an allowance of such Claims.

Applicants respectfully request that the Examiner call Applicants' attorney/agent at the below listed number if the Examiner believes that such a discussion would be helpful in resolving any remaining problems.

Respectfully submitted,

By: _____

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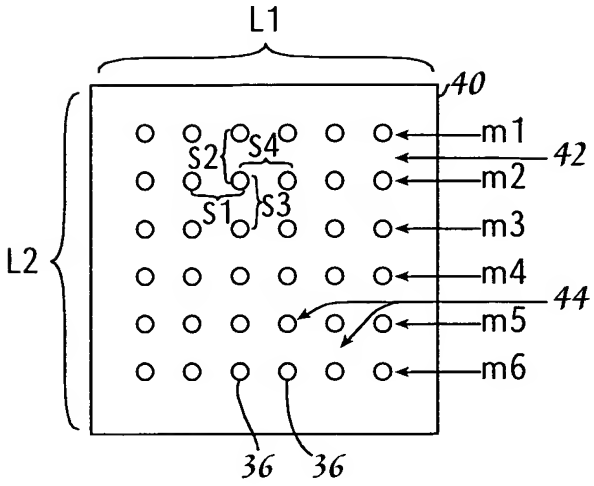

Fig. 6

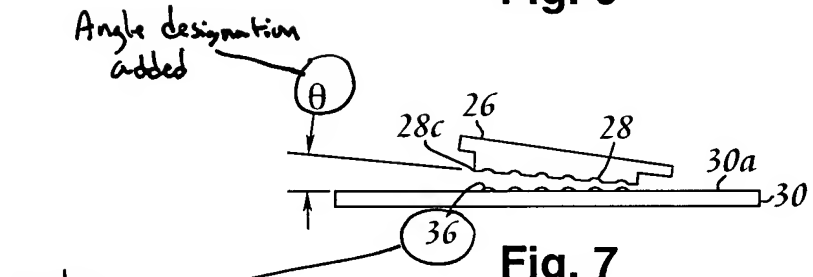

Fig. 7

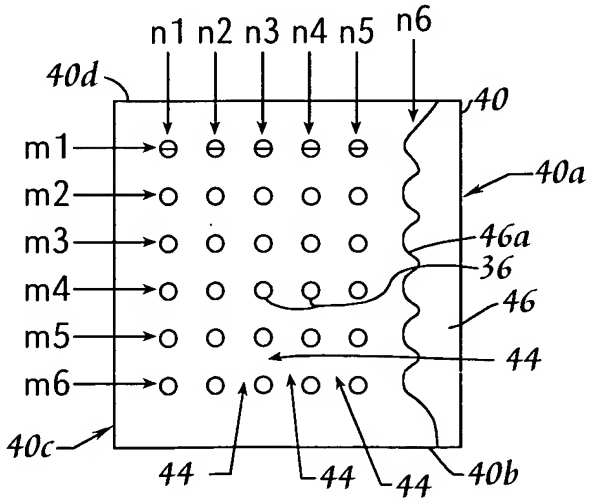

Fig. 8